A Case of Equine Thyroid Follicular Carcinoma Accompanied with Adenohypophysial Adenoma
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(Received 24 December 1986/Accepted 11 March 1987)

KEY WORDS: adenohypophysial adenoma, horse, thyroid follicular carcinoma.

Reports on thyroid carcinoma in the horse are rather rare, though there are many papers on it in dogs, cats and human beings [1, 2, 4–6, 8, 10–12]. Thyroid adenoma in horses was detailed by Yoshi-kawa et al. [16], and histopathologic studies on thyroid carcinoma in a horse reported only by Joyce et al. [9]. This report describes pathologic findings on a case of thyroid follicular carcinoma. The case was a thoroughbred horse, aged 15 years. Such symptoms as coughing, anorexia, depression and enlargement of the perithyroidal area of the neck became obvious from July 20, 1984. The animal was admitted twice to the Veterinary Hospital of Iwate University for clinical examinations and treatment on July 28 and August 28, and died on September 11, 1984. The serum concentrations of calcium and inorganic phosphorus were 11.2 mg/dl and 2.1 mg/dl on July 28 and 11.3 mg/dl and 3.8 mg/dl on August 28, respectively.

Tissues were fixed in 10% neutral formalin at autopsy and embedded in paraffin. Sections were made and stained with hematoxylin and eosin (HE). Selected sections were deparaffinized and subjected to the peroxidase-antiperoxidase (PAP) method [13] with a commercial immunoperoxidase kit (Immulk Histose, Immulok Inc., Calif.). Tissue blocks for electron microscopic examinations were taken from a formalin-fixed tumor of the neck and postfixed in 1% Millonig’s OsO₄ at pH 7.3. They were dehydrated in a series of graded alcohols and embedded in Epon 812. Ultra-thin sections were stained with uranyl acetate and lead citrate, and observed under a Hitachi H-800 electron microscope at 100 kv.

Autopsy revealed a tumor at postpharyngolaryngeal region involving the trachea, esophagus and carotid arteries. It was measured 19 by 16 by 11cm in size and whitish on the cut surface. There were various consistencies, elastic, hard, bony or transparent, on the cut surface (Fig. 1). Metastatic nodular lesions were observed on the pericardium, mediastinum, pulmonary pleura, pleura of thoracic walls, mesenterium, omentum major and capsule of the spleen in various degrees. The pituitary gland was enlarged to a quail-egg size.

Microscopically, neoplastic tissue was easily differentiated from surrounding tissues including the metastasized lymph nodes which were mostly

Fig. 1. A cut surface of the tumor at perithyroid area of the neck surrounding the trachea. The transparent region is seen in the lower right of the tumor (arrow).

Fig. 2. Follicular proliferation forming irregular cystic structures with proliferation of stroma in the tumor of the neck. HE stain, ×53.
replaced by neoplasm. In most area of the tumor of the neck, irregular cystic structure of neoplastic epithelia with proliferated stroma was found (Fig. 2). Neoplastic cells were flat or cuboidal and scarcely multilayered. The structure was cystic, irregularly tubular or of adenomatous arrangement. In the stroma, proliferation of fibroblasts and chondrocytes were observed with partial ossification (Fig. 3). In some parts of the tumor, small follicles with very few stroma were seen (Fig. 4). Original thyroid follicles with colloid were observed (Fig. 5) coinciding with the transparent lesion in Fig. 1. This original tissue was transitional to the surrounding neoplastic tissues. Metastatic lesions were observed also in the right adrenal cortex as well as mesenteric, profound cervical and periaortical lymph nodes. In the pituitary gland, proliferation of lobular structure in the intermediate lobe was obvious (Fig. 6), and the proliferated cells were columnar or spindle and had strongly eosinophilic cytoplasm and a small spherical nucleus (Fig. 7). It was diagnosed as adenohypophysial adenoma arising from the intermediate lobe [14].

Electron microscopic examinations disclosed well-developed rough-surfaced endoplasmic reticulum in the cytoplasm, microvilli on the cell surface, and moderate number of desmosomes (Fig. 8). Many collagen fibers running various
directions were observed in the stroma with occasional calcium salt aggregations in the ossified area (Fig. 9).

Parafollicular cells (C cells) stained positively were demonstrated only in the original thyroid tissue (Fig. 10), but not in the neoplastic tissues. From the above findings, the present case was diagnosed as thyroid follicular carcinoma with systemic metastasis. This was also compatible with follicular carcinoma by the classification of the World Health Organization [15] and follicular adenocarcinoma by the classification of Capen [3]. The etiology of the present case is still obscure, but there might be some endocrinologic relationships between the thyroid carcinoma and the adenohypophysial adenoma of the pituitary gland. It is known that the intermediate lobe of the pituitary gland excretes melanocyte-stimulating hormone (MSH) [7], and it has been reported that MSH has adrenocorticotropic and thyroid-stimulating hormone (TSH) activities as well as TSH-releasing and spermatogenesis-inhibiting effects [7]. So hormonal disorder might
have preceded or followed in the serum of the present case. Further investigations would be needed to elucidate the pathogenesis of the neoplasms by examining serum specimens for hormonal balance.

ACKNOWLEDGEMENTS. The authors wish to express their thanks to Associate Professor Y. NAITOH, Department of Veterinary Internal Medicine, for allowing them to refer his data and giving an opportunity to examine the specimens. This study was supported in part by a Grant from Iwate Racing Association and by a Grant-in-Aid for Scientific Research (No. 61440021) from the Ministry of Education, Science and Culture of Japan.

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